



UNIVERSITY OF  
CAMBRIDGE | Energy Policy  
Research Group



## **COMPETITION EARLY IN THE LIFE CYCLE OF INFRASTRUCTURE PROJECTS**

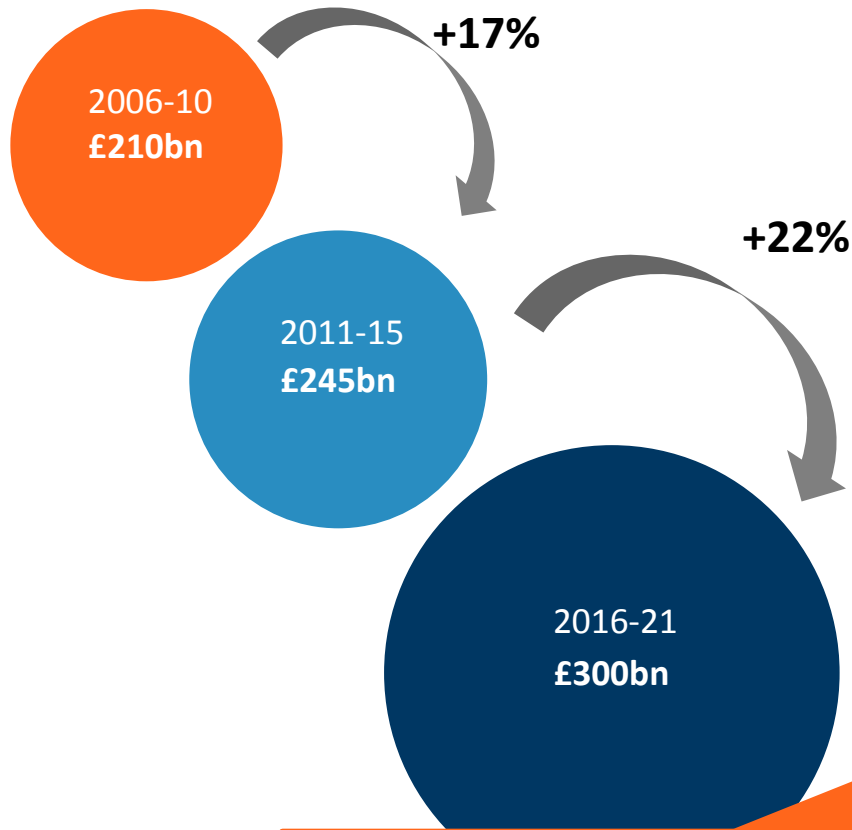
Introducing competition in the provision of onshore electricity transmission networks

# The National Infrastructure Committee estimates £300 billion will be spent on UK infrastructure projects in the next 5 years...

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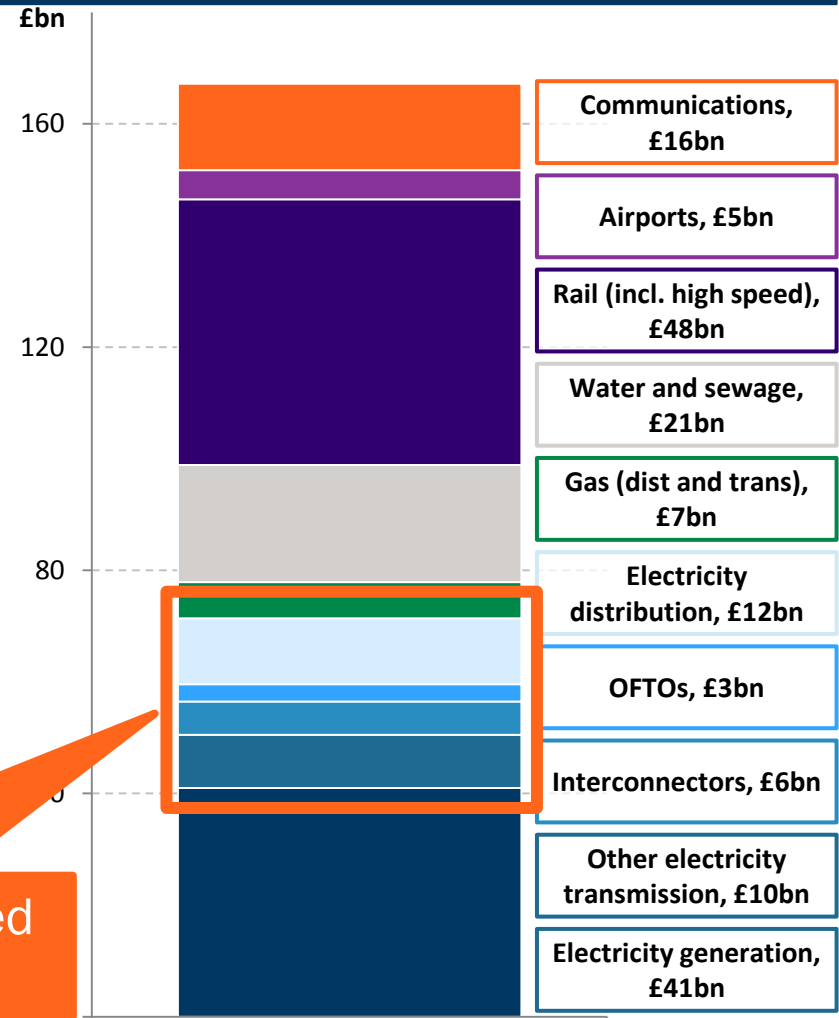
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Despite (or perhaps because of) Brexit uncertainties, infrastructure spend is planned to increase....



Of which c£30bn is anticipated to be in electricity networks

...with c£167bn being spent on regulated utility related infrastructure



Sources: 1) Infrastructure and Projects Authority (2016), "National Infrastructure and Construction Pipeline Analysis" and "Methodology and Sources for National Infrastructure Delivery Plan 2016-21".

...and regulators are seemingly keen to open up markets to competition to provide opportunities for new players...

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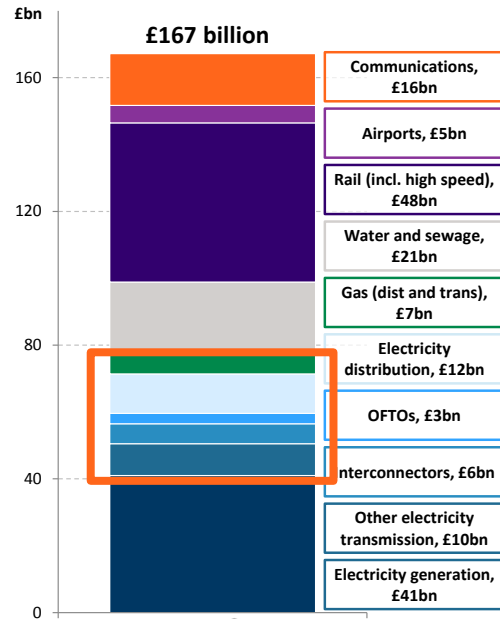
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Historically, existing (typically monopoly) providers would have delivered most of this....



...overseen by (increasingly complex) regulatory regimes



New players and new sources of finance keen to access regulated asset revenue streams....



....and regulators keen to facilitate this as believes will lower cost to consumers

Existing players have delivered 12 OFTOs to date, corresponding to £2.2bn of assets.

# Perceived successes of OFTOs, Interconnectors and Thames Tideway has led to quest to introduce more competition

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### Early competitive processes have tended to derisk projects...

- Regulators preference for derisked projects (e.g. Thames Tideway, OFTOs)
- ....has delivered very low headline WACC
- But project risks have often tended to be borne by taxpayers , customers and/or incumbent providers.

### ...but future projects might be more difficult to derisk

- Onshore electricity asset construction more risky process...
- ...future direct procurement model in water could lead to more risk in projects than Thames Tideway project.

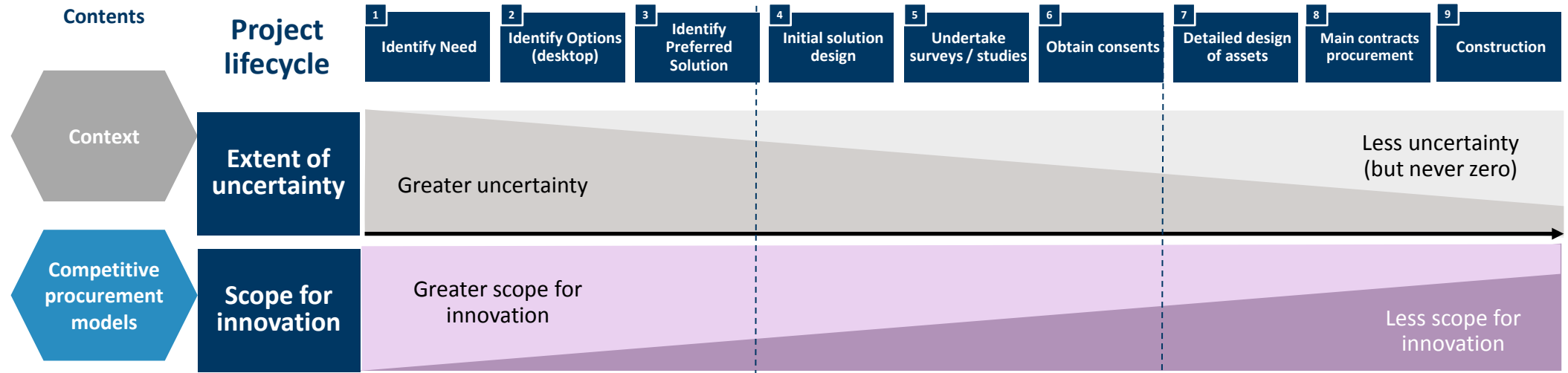
**While potentially beneficial, sector regulators need to be careful how to apply competition as complexity of projects increases...**

- **Over derisking of projects** - against regulatory principle of leaving risks with those best placed to manage them
- **Sub-optimal investment decisions** – preference for large projects that can be competed and risk of less innovation.

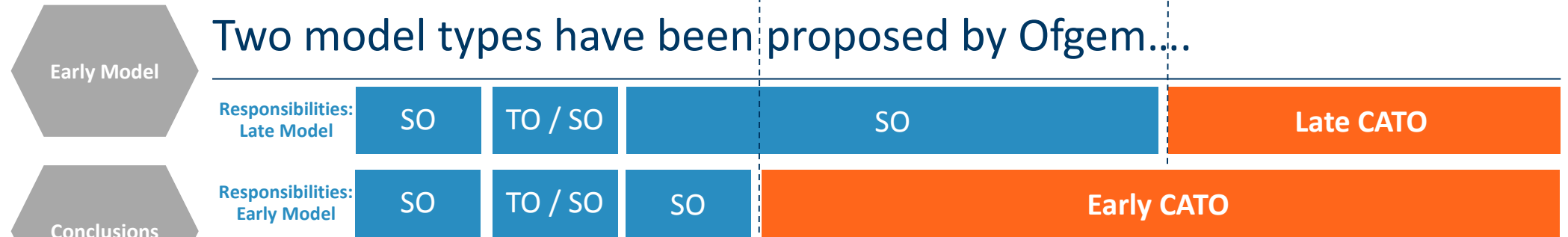
**...as otherwise consumers could end up paying more**

Partly in recognition of these risks, Ofgem has been considering a range of options for introducing competition in onshore electricity transmission

# The key issue with onshore electricity transmission is where in the typical investment cycle to introduce the competitive process



Two model types have been proposed by Ofgem....



**Key trade offs**

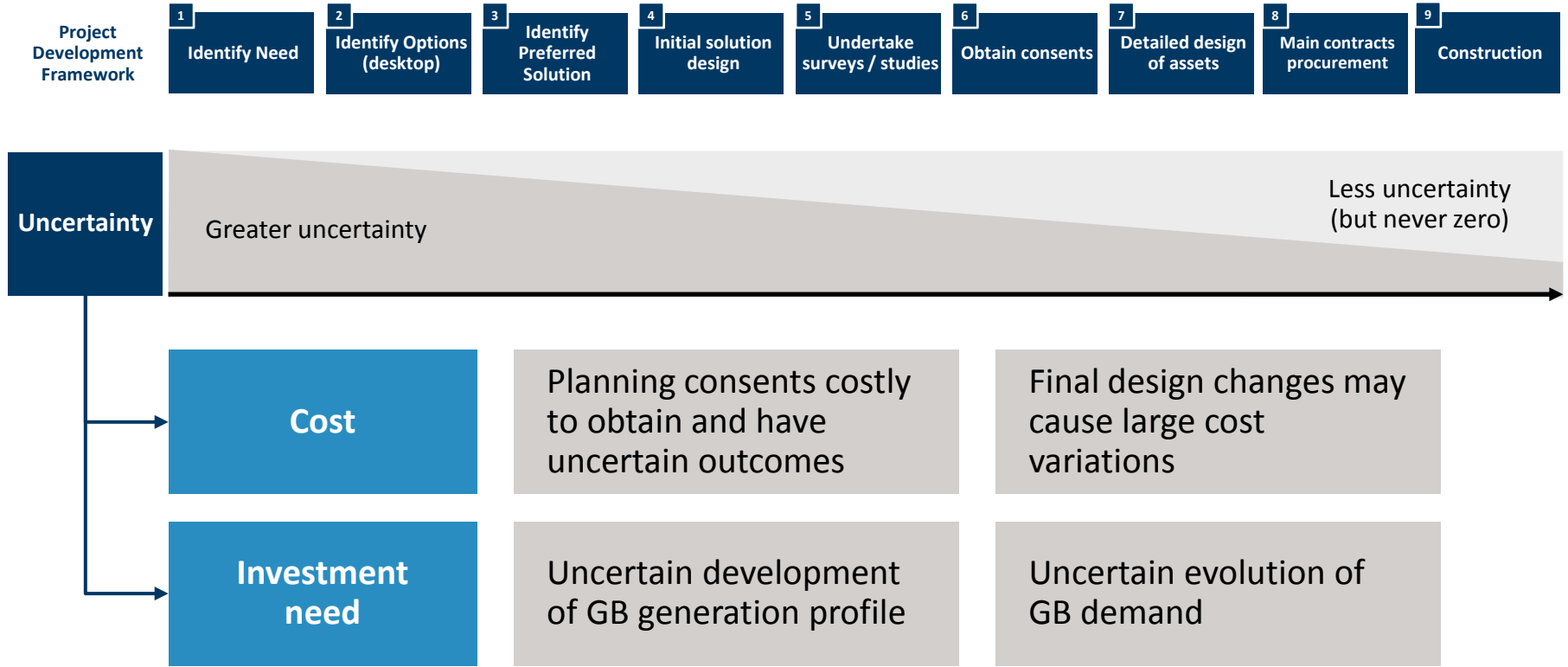
- Late model lose potential for competition to create innovative solutions..
- ...but have greater certainty in project – therefore more potential competitors

...with Ofgem preferring the Late CATO model – on the grounds that it is more implementable (and most similar to OFTO model).

To introduce competition early in the lifecycle of a project, two key uncertainties on risk and 'investment need' must be managed...

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... offers potential of unlocking much greater innovation.

We worked with the c 30 participants in sector (finance companies, engineering firms, transmission companies and regulator) to develop potential Early model.

# We started with studying possible case studies....

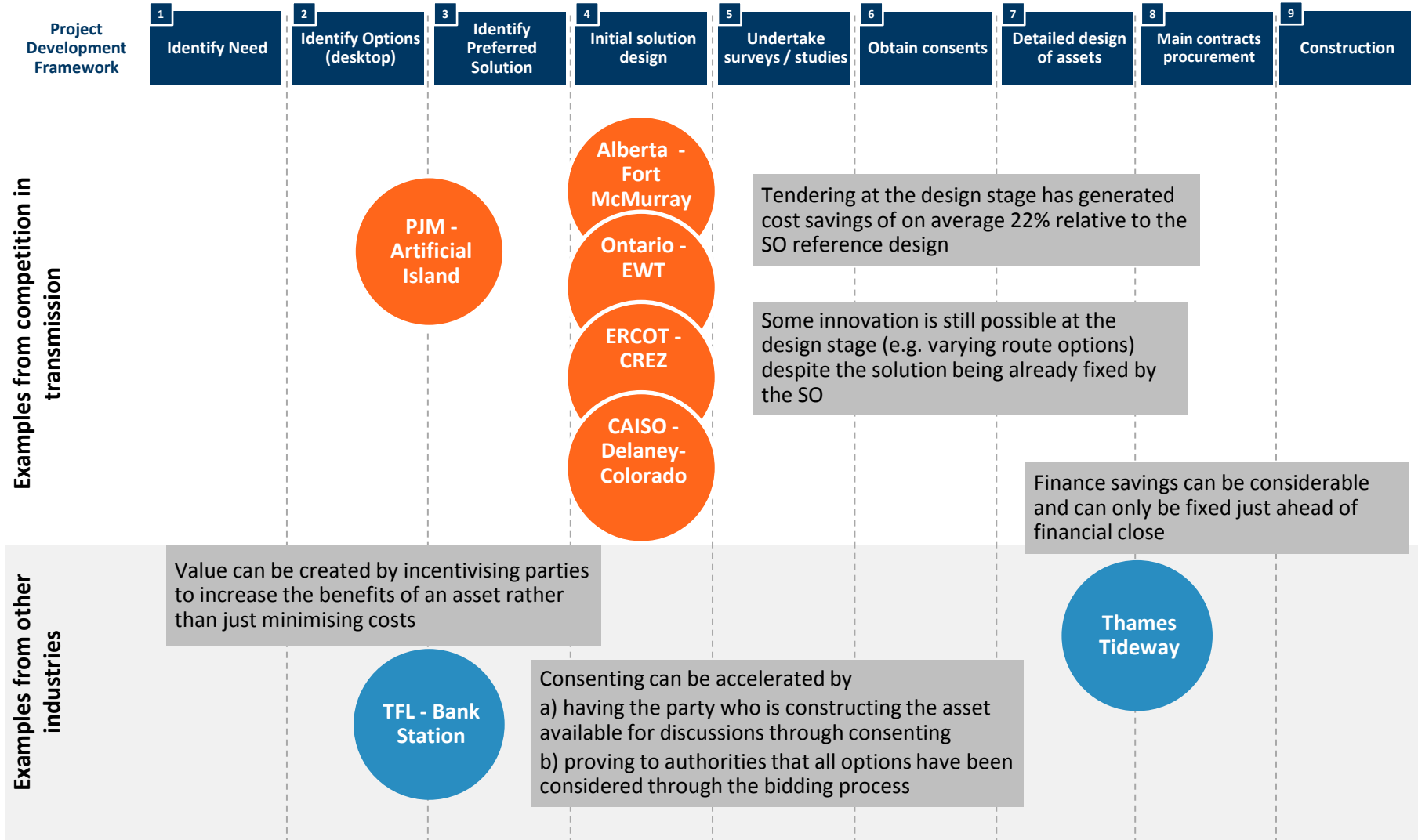
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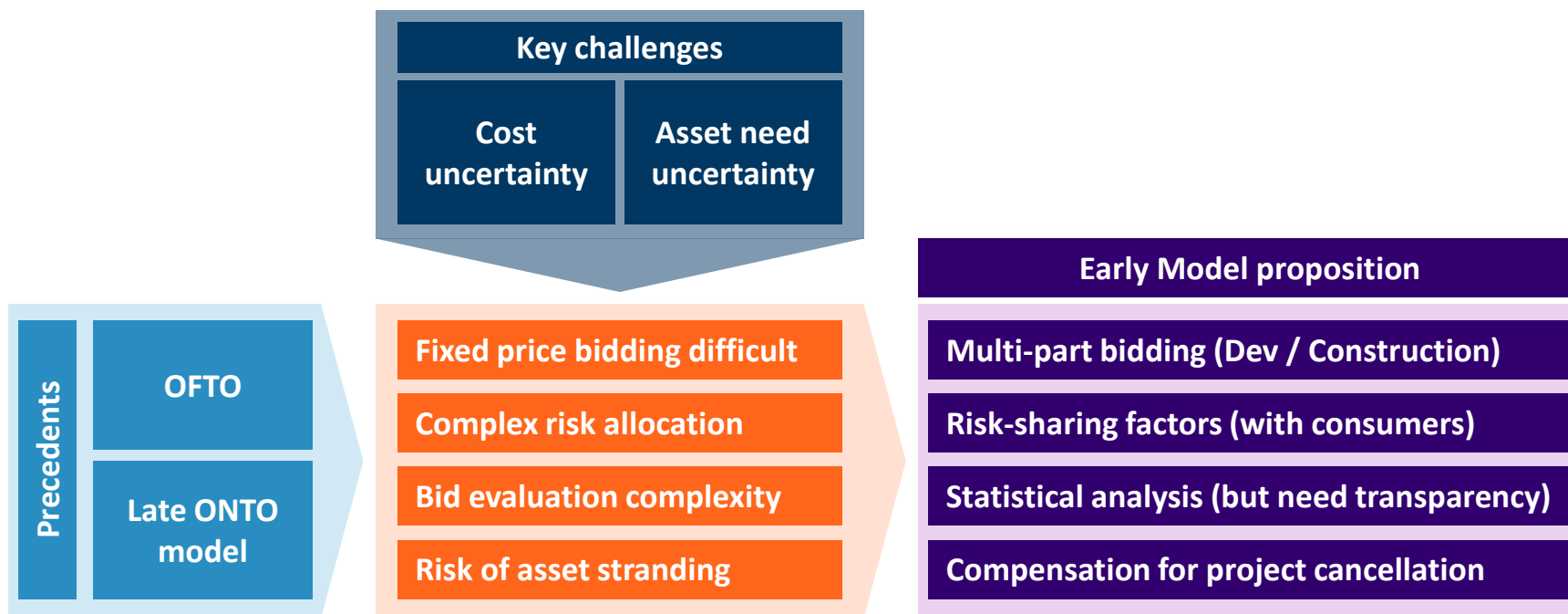


....and found that there were some precedents of an early model

# To develop an Early Model, 4 key issues need to be solved....

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# Fixed, single bid as per OFTOs and the late CATO model won't work – need more complexity in bidding process

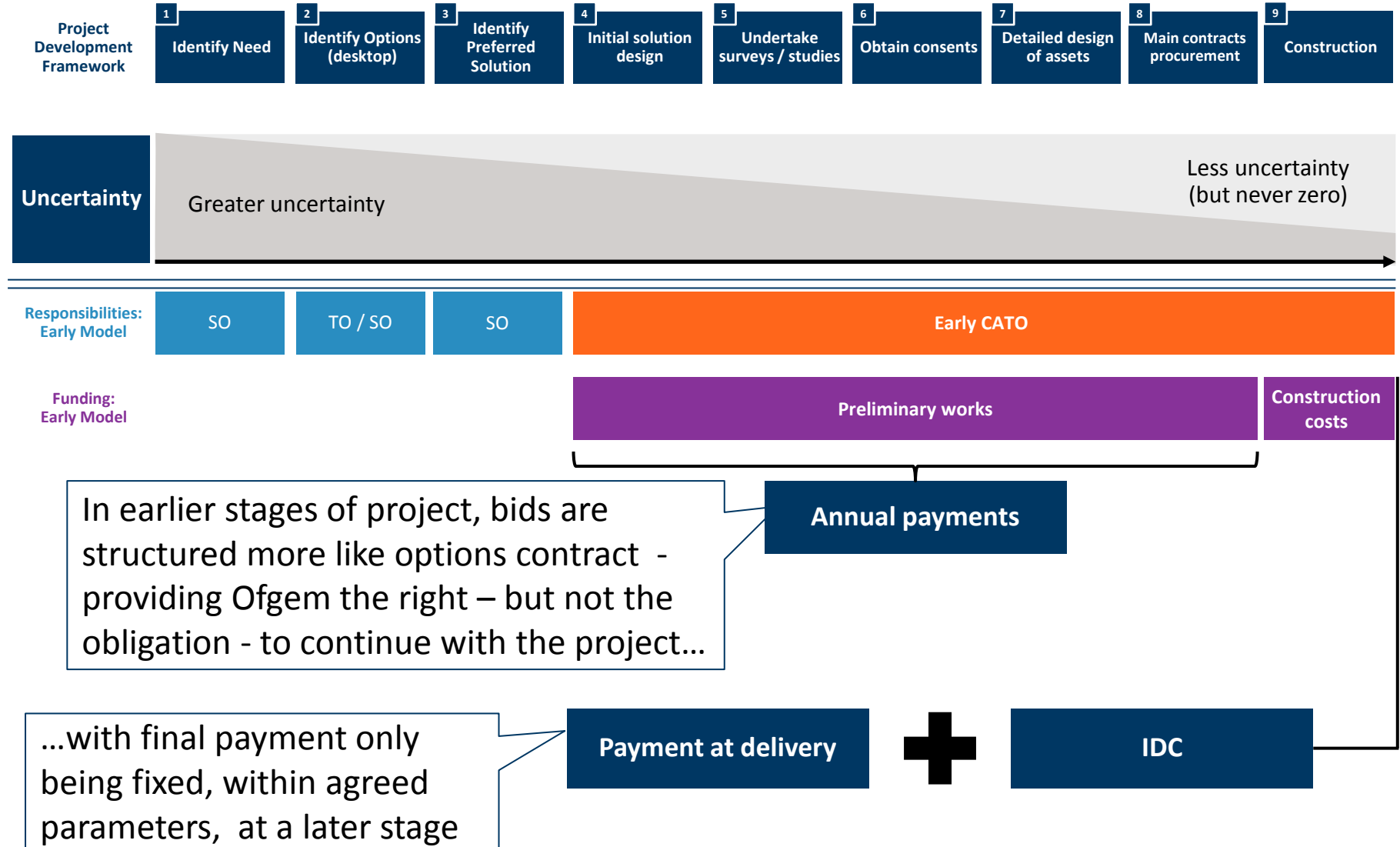
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# To manage cost uncertainty, risks would need to be shared with consumers

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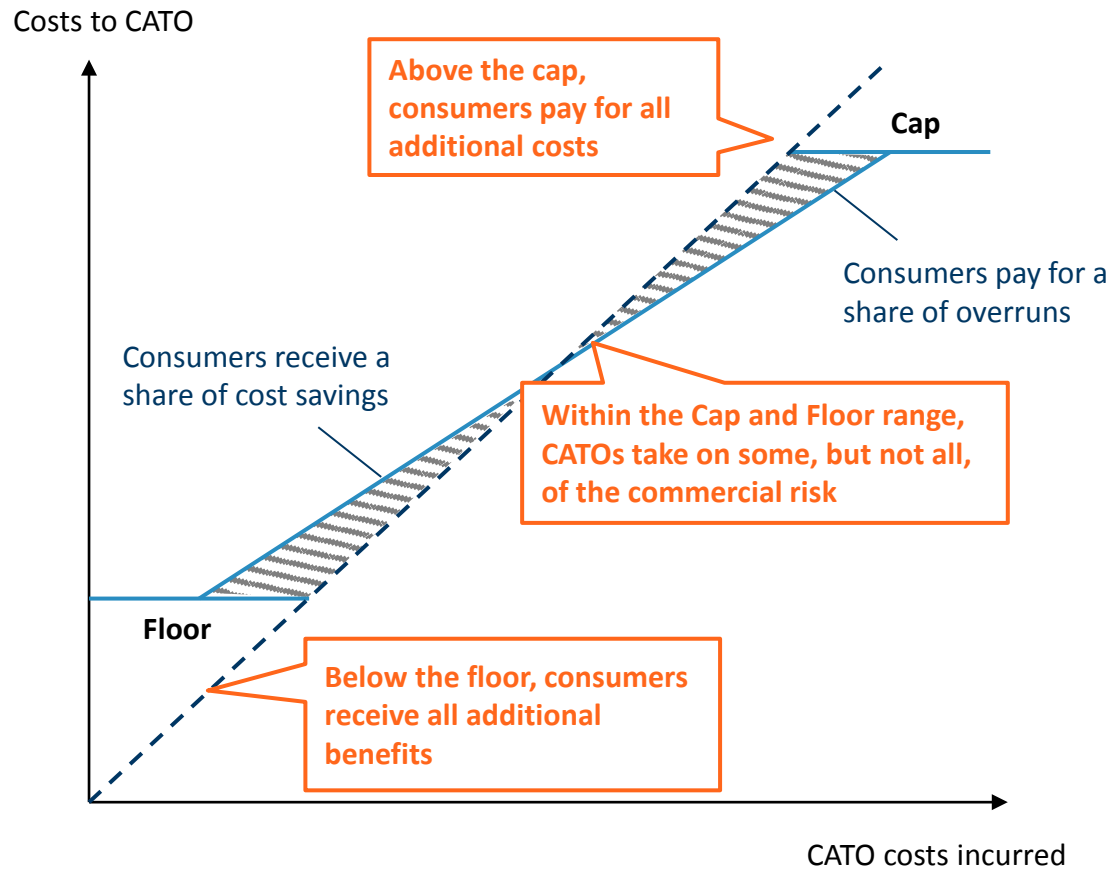
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## Illustration of single cost item



For each cost item, bidders submit:

Cap and floor

Sharing factor

This reveals bidders' true risk appetite and willingness to absorb cost risks (rather than pass them on to GB consumers).

# Assessment of bids with different sharing factors is probably the most complicated part as no longer comparing “like-for-like”

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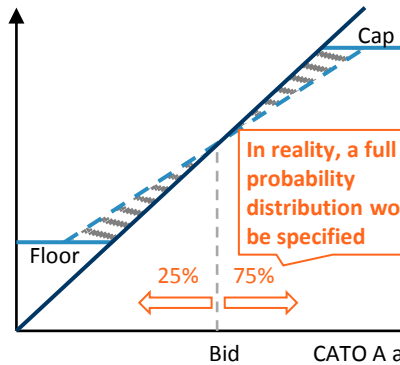
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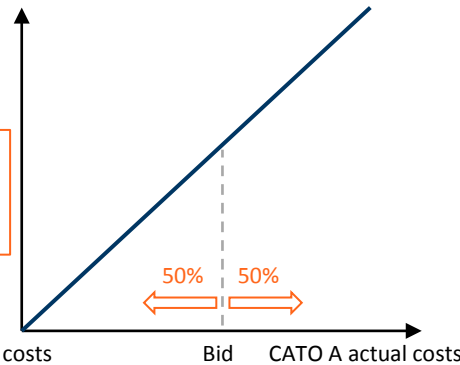
### Cost with partial pass through, e.g. commodity prices

Costs to consumers



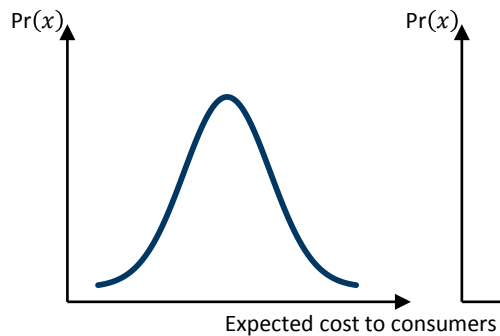
### Cost with full pass through, e.g. inflation

Costs to consumers

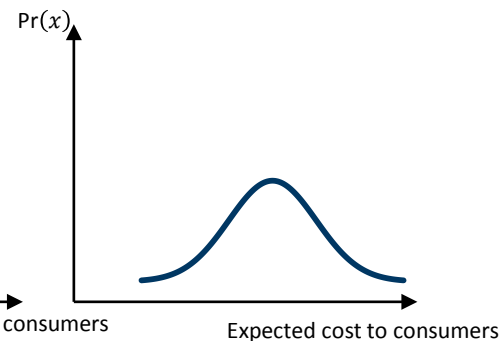


- Conflate distributions of different costs across all of the CATO's bid parameters and costs.
- This would provide an overall expected distribution of consumer costs on a comparable basis across bidders.

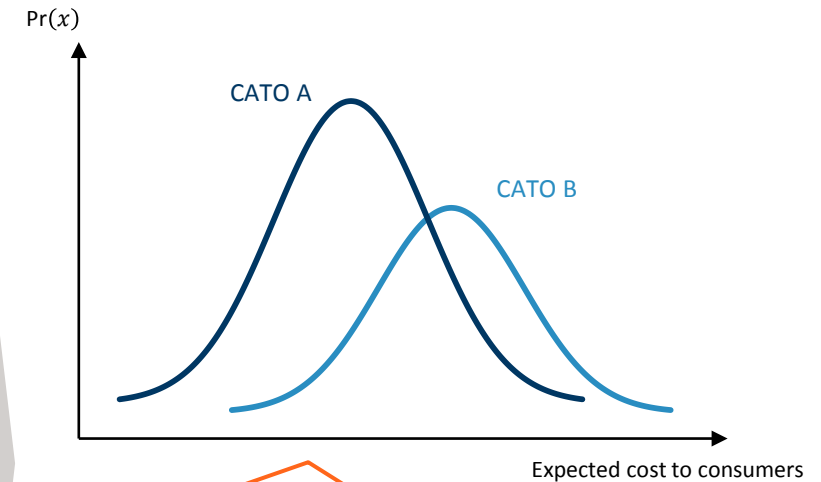
### Expected distribution of costs to consumers due to commodity prices



### Expected distribution of costs to consumers due to inflation



### Illustrative use of Monte Carlo simulation to assess bids:



- CATO A selected on the basis of the lowest expected cost (50<sup>th</sup> percentile) to consumers
- Underlying simulation parameters must be the same for all bidders

# CATOs should also receive fair compensation if the project is cancelled

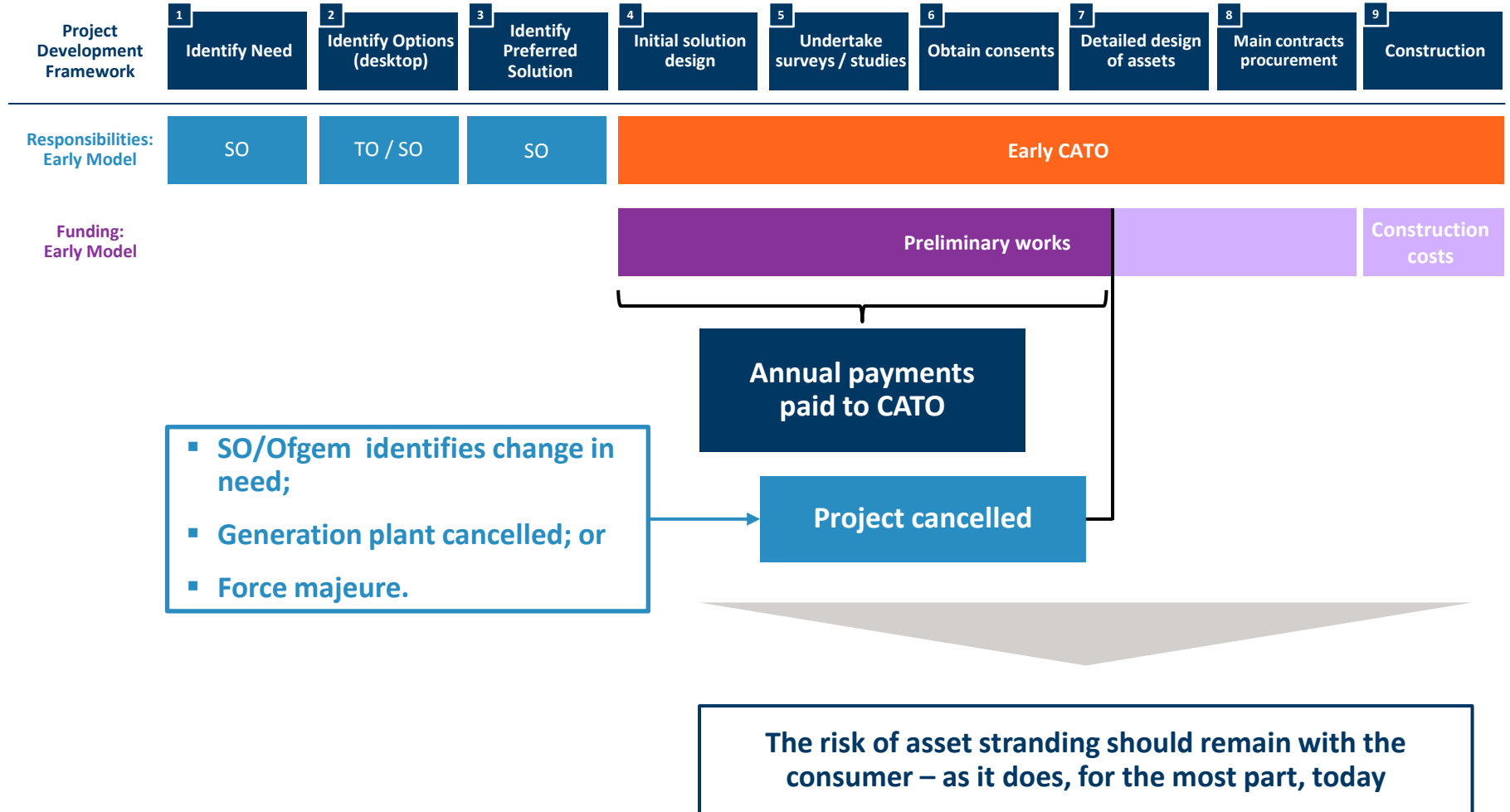
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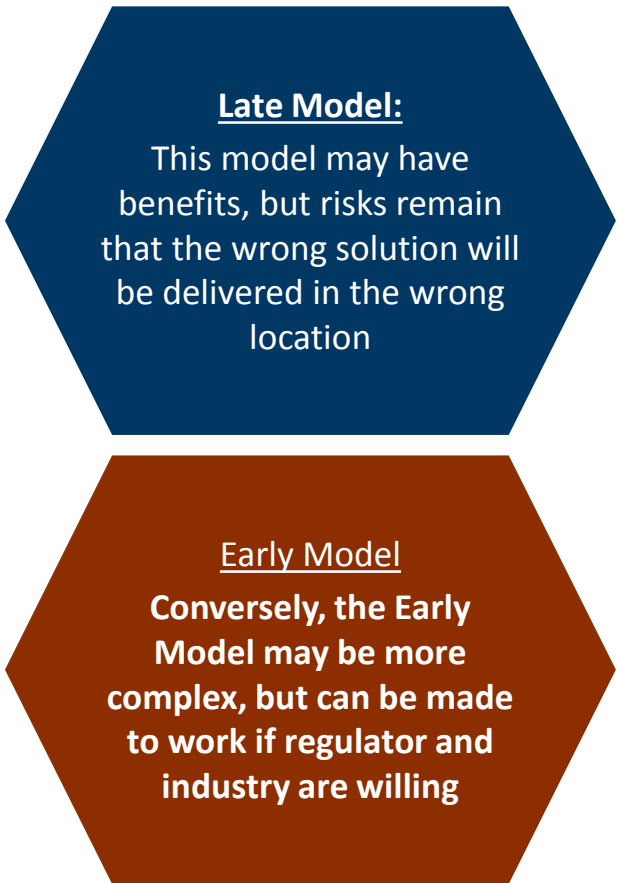
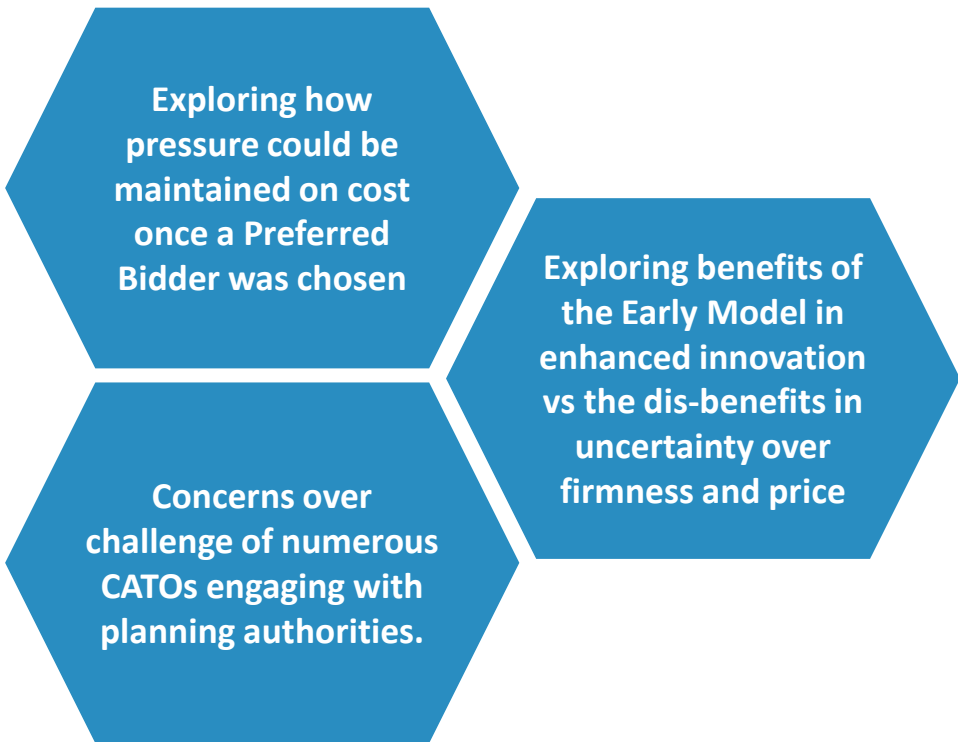


Notable consensus across all stakeholders that, in principle, early competition could bring much greater innovation to the sector

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Key issues to be resolved include.....





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